

**ABSTRACT**

The present invention is directed to a fuel supply and fuel system with an ion filter and an ion gauge. The filter can be made from discrete pieces of polymeric filter material. The polymeric filter material is substantially the same as the proton exchange  
5 member in the fuel cell. The ion gauge measures the level of ions in the fuel by measuring a voltage across a section of fuel or a current through the same section. The voltage or current is related to the ion level in the fuel.